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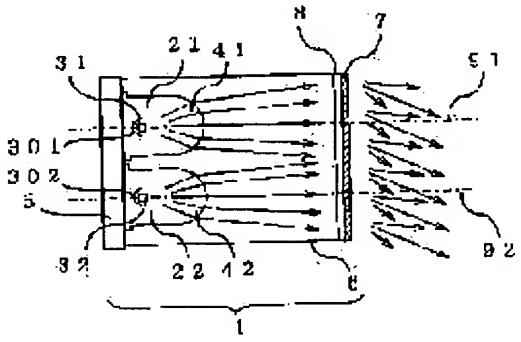
(54) LIGHT SOURCE UNIT AND DISPLAY DEVICE, DISPLAY AND ILLUMINATION DEVICE USING IT

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a light source unit which reduces dispersion caused by the directivity characteristics of plural light source means in the display characteristics of individuals and supplies high-illuminance image light to a desired visual field.
SOLUTION: A light source unit 1 is provided with a substrate means 5, the light emitting diode elements 21, 22 which are arranged on this substrate means 5, a substrate material 8 disposed in front of these light emitting diodes 21, 22, a holographic optical element 7 formed on one side of this substrate material 8 and a housing means 6 which supports this holographic optical element 7 and the substrate material 8. And the light radiated from the light emitting elements 21, 22 is incident on the holographic optical element 7, deflected and made to diffuse to be radiated to specified directions.



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CLAIMS

[Claim(s)]
[Claim 1] The light source unit which consists of a holographic optical element which it is arranged [optical element] ahead of the light source means which consists of a light emitting diode component arranged at the position of a substrate means, and a light source means, and diffuses the light from a light source means in the predetermined direction.
[Claim 2] It is the light source unit characterized by having the protection-from-light means arranged near the light source means which consists of a light emitting diode component arranged at the position of a substrate means, the holographic optical element which it is arranged [optical element] ahead of a light source means, and diffuses the light from a light source means in the predetermined direction, and the light emitting diode component, and for said holographic optical element being supported by a part of protection-from-light means, and being arranged ahead of a light emitting diode component.
[Claim 3] Said holographic optical element is a light source unit according to claim 1 or 2 characterized by consisting of a transparence substrate ingredient with which a prism means is formed in the plane of incidence of light, and a hologram side is arranged in another field.
[Claim 4] Said transparence substrate ingredient is a light source unit according to claim 3 characterized by being the light filter which penetrates the wavelength component of the specific range alternatively.
[Claim 5] the light source unit [a claim 6] characterize by to have the holographic optical element which consist of a transparence substrate ingredient which be arrange at the position of a substrate means, have the light source means which consist of two or more light emitting diode components which emit the light of different wavelength, and a prism means come to arrange the unit structure of a different prism configuration corresponding to two or more luminescence dominant wavelength of a light emitting diode component, in the plane of incidence of light, and have a hologram side in another field The light source unit which is arranged the light source means which consists of a light emitting diode component arranged at the position of a substrate means, and ahead of a light emitting diode component, and is characterized by having the resin lens of a light emitting diode component, a lens means to constitute a synthetic lens system, and the holographic optical element that forms a hologram side in the optical outgoing radiation side of this lens means.
[Claim 7] The light source means which consists of two or more light emitting diode components arranged at the position of a substrate means, The array-like lens plate which corresponds to each of two or more of said light emitting diode components, and carries out the image formation transfer of the configuration of the 1st predetermined side which is the optical outgoing radiation side of light emitting diode on the 2nd predetermined side, The light source unit characterized by having the holographic optical element which it is arranged [optical element] in said 2nd predetermined side, and diffuses the light from said lens plate in the predetermined direction.
[Claim 8] Said two or more light emitting diode components are light source units according to claim 7 characterized by being constituted so that an outgoing beam may be condensed on each lens element of said array-like lens plate.
[Claim 9] The light source unit characterized by having the light source means which consists of

a light emitting diode component arranged at the position of a substrate means, the light pipe which leads the light from a light source means to a predetermined field, and the holographic optical element which plane of incidence is arranged [optical element] in this predetermined side, and diffuses the light from a light pipe in the predetermined direction.
[Claim 10] The light source unit characterized by having the light source means which consists of a light emitting diode component arranged at the position of a substrate means, the optical integrator which leads the light from a light source means to a predetermined field, and the holographic optical element which plane of incidence is arranged [optical element] in this predetermined side, and diffuses the light from an optical integrator in the predetermined direction.
[Claim 11] Said light emitting diode component is a light source unit according to claim 1 to 4 characterized by being arranged in the location from which the pellet separated from the optical axis of the resin lens of a light emitting diode component, and light directing in the predetermined direction.
[Claim 12] Said light source means is a light source unit according to claim 7 to 9 which consists of two or more light emitting diode components which emit the light of mutually different wavelength.
[Claim 13] The light source unit according to claim 9 characterized by arranging a diffusion means at the inside near the outgoing radiation opening edge of said light pipe.
[Claim 14] The outgoing radiation opening end face of said optical integrator is a light source unit according to claim 9 characterized by leaning from a field perpendicular to the normal of a light source unit.
[Claim 15] The light source unit according to claim 9 characterized by either being [of the plane of incidence of said optical integrator, and an outgoing radiation side] an aspheric lens at least.
[Claim 16] Said holographic optical element is a light source unit according to claim 9 characterized by sticking to the outgoing radiation side of an optical integrator, and being arranged.
[Claim 17] Said holographic optical element is a light source unit according to claim 1 to 16 characterized by having both the refraction operation which deflects incident light in the one predetermined direction, and the diffusion which the predetermined range is made to diffuse.
[Claim 18] Distribution of the light diffused by said diffusion is a light source unit according to claim 1 to 16 characterized by being the horizontally large property of being perpendicularly narrow.
[Claim 19] The display which arranges a light source unit given in either of claim 1 to claims 18 in the shape of a XY matrix, controls luminescence of each light source unit, and displays an image.
[Claim 20] The drop which arranges and constitutes the light source unit of a publication from a claim 1 in either of claims 18, and displays a predetermined fixed pattern.
[Claim 21] The lighting system constituted with the aggregate of the light source unit of a publication, or a light source unit by either of claim 1 to claims 18.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] While two or more kinds of light emitting devices (for example, light emitting device which emits red and a green and blue light) which emit the light of mutually different wavelength are arranged at the position on a substrate and constitute a unit unit, this invention It is related with the image display device which realizes a color picture display, and its application equipment, for example, the drop and lighting system which display a fixed pattern, by constituting a luminescence screen from arranging this unit unit regularly, and controlling that luminescence.
[0002]
[Description of the Prior Art] Although the display serves as a key device in recent years for the electronic equipment of not only information machines and equipment but many, in addition to CRT which has so far expanded the commercial scene in the large-scale image field which provides many people with information at once on the display of a big screen, or a discharge tube method, the full color LED display using a light emitting diode component (it considers as an LED component henceforth) is marching out greatly. It is because the needs as the public plotting board which a blue LED component is fertilized in addition to an authentic green LED component, and this is established permanently on the wall surface of the color reproduction range having not only spread greatly but a common building not only a conventional stadium and a conventional amusement center but, and offer various information to many and unspecified human beings have increased. Such a big screen display will be used in the location where strong ambient lights, such as the sun, generally exist in many cases, if the case of the specification used under indoor [where the amount of ambient lights is comparatively low], and special lighting is removed. Therefore, compared with the small display unit made supposing 1-several observers, it is required that it is very high brightness, that it has a means to control the contrast reduction by outdoor daylight, that it should be related horizontally and should have a large angle of visibility especially, etc. Furthermore, conditions severe about weatherability, a life, maintenance nature, etc. will be searched for.
[0003] For example, in a LED display, it can cover with ready-made LED components, such as the pilot lamp mold LED or the chip mold LED, in the shape of a matrix, a display screen can be constituted, and the display which was excellent in a life, a price, weight, etc. compared with other big screen displays can be realized. Moreover, the modularization of two or more LED components which are equivalent to several pixels from 1 pixel is carried out, and there is also the approach of arranging this unit unit in the shape of a matrix, and constituting the whole screen. Thus, by the approach of arranging a ready-made light emitting device, in order to be greatly dependent on the engine performance of a light emitting device in which luminous-intensity-distribution distribution of a display unit constitutes a unit unit, and to obtain a desired angle of visibility and brightness as the whole equipment, various devices are made.
[0004] For example, drawing 20 is the sectional view having expanded and shown some conventional typical LED display equipments. In drawing, 1 is a unit unit which constitutes a display unit. Moreover, 2 is the array of an LED component and the LED components 25, 26, 27,

and 28 are arranged on the substrate 5 here. When performing a full color display, the LED component of the foreground color of red, green, and blue (hereafter referred to as R, G, and B, respectively) will be used. moreover, G and B in order [R] to maintain the balance of each color on the strength -- the LED component of a required number is arranged, respectively and the unit unit is constituted. 90 is the normal of a display unit, and each LED components 25, 26, 27, and 28 are arranged so that it may become parallel to this normal 90. Moreover, 62 and 63 are protection-from-light means arranged along the horizontal direction of a display between each unit, and it prevents strong outdoor daylight, such as sunlight, advancing into the screen of a display unit. By a diagram, the arrow head of a continuous line shows outdoor daylight notionally.

[0005] It depends for the angle of visibility of conventional LED display equipment like drawing 20 on the directional characteristics decided with the dispersant which produces the diffusion of the resin lens prepared at the tip of an LED component, or light greatly. For example, although the transverse-plane brightness of a display unit can be made high if an LED component with high transverse-plane brightness with strong directivity is used, an angle of visibility becomes narrow. If the LED component which strengthened diffusibility and weakened directivity on the other hand is used, although a display unit with a large angle of visibility is realizable, transverse-plane brightness will become low. Thus, since a trade-off of an angle of visibility and brightness exists in an LED component, according to the military requirement of a display, at the sacrifice of either, or both compromise value will be calculated. As mentioned above, although the angle of visibility of a display unit can be decided if the property of an LED component is determined, an angle of visibility may be further restricted in fact by display component parts other than an LED component like the protection-from-light means 62 and 63 grades.

[0006] According to these protection-from-light means 62 and 63, reduction of the contrast of the display image resulting from outdoor daylight advancing to the screen can be suppressed. When establishing a display unit permanently on the outdoors, since the include angle of the outdoor daylight which advances into the screen, or reinforcement can be predicted generally, a unit unit is constituted so that display engine performance, such as a desired angle of visibility, brightness, and contrast, may be obtained, and a protection-from-light means is arranged. However, the angle of visibility of the vertical direction will be restricted by these protection-from-light means 62 and 63 compared with a horizontal direction. Drawing 20 explains this again. In drawing, the minimum of the visual field range of the vertical direction to a display unit is determined like the broken line of drawing from the configuration of a protection-from-light means, and the relation between arrangement and arrangement of an LED component. That is, the include angle in [A] drawing can define a downward angle of visibility from the reference axis of a unit unit. Although the protection-from-light effectiveness will become high if the protection-from-light members 62 and 63 are made long in the normal 90 direction of equipment, an include angle A becomes small and the visual field range of the vertical direction is narrowed. Conversely, although a protection-from-light means must be short if it is going to extend the visual field range of downward to a display unit, it becomes difficult to suppress the contrast reduction by outdoor daylight. Such a trade-off is unrelated to the class of light emitting device which constitutes a display unit, and also when light emitting devices other than an LED component are used, it may be produced.

[0007]

[Problem(s) to be Solved by the Invention] In the case of a big screen display unit, an image is offered to a lot of people, namely, a display unit is installed in a high location more relatively than an observer for the purpose which provides the large visual field range with an image, and, generally, an observer's physical relationship of checking a display by looking from the lower part of a screen increases. For example, the situation of looking up at the display unit installed in the wall surface of a building from on the street is equivalent to this. In such a case, the light which goes upwards from a display can say that the light which goes below is not important. In other words, it is horizontally large, and if the luminous-intensity-distribution property which strengthened the lower part can be given in the vertical direction, light can be efficiently collected to the field where an observer exists, and a bright display can be offered in this limited range to it.

[0008] As a device which cancels un-arranging [for which light will be vainly emitted to the field in which such an observer is not present], the cross-section configuration of the resin lens of an LED component can be made into an ellipse, and an anisotropy can be given to directional characteristics, for example, directivity horizontally larger than the vertical direction can be given, and light can also be made to emit to the field where an observer exists effectively. However, it is also difficult for there to be an include-angle-limitation in directive control by such flat lens configuration, and to control the directivity of the vertical direction. Furthermore, the location precision of an LED pellet required in order to acquire the proper lens effectiveness in fact, and the process tolerance of a lens configuration are low, and since there is dispersion which cannot be optically disregarded to the directional characteristics for every component, the fault of spoiling the display homogeneity of a display unit remarkably has arisen. For example, also when an image with homogeneity high when it observes from the location which carried out the right pair to the screen when the image of all whites was being displayed can be observed, if it moves to the location from which it separated from now on and a display is observed from across, the patchy pattern resulting from the above-mentioned directional-characteristics dispersion will appear. Such degradation of image homogeneity is a problem common to the display unit not only when the LED component of a flat lens is used but at large which generally used the LED component.

[0009] Moreover, the particle called a dispersant for angle-of-visibility increase may be scoured near the resin lens section of an LED component, or the diffusion plate containing a dispersant may be arranged ahead of an LED component. However, the physical quantity to contain is proportional to the spreading effect acquired mostly, and if it is going to diffuse such a diffusion means widely, it must increase the amount of a dispersant, and the thickness of a diffusion plate. Therefore, the permeability of light had to become low and had to sacrifice brightness as a result for angle-of-visibility increase.

[0010] When the above unit units 1 are arranged and a display unit is constituted, it originates in the geometric relation between the array of two or more light emitting devices which constitute each unit unit, and a protection-from-light member, and the problem that a foreground color changes with chance [of receiving a display unit] angles arises. Drawing 21 is drawing showing the configuration of the conventional typical LED display roughly. In drawing, Notations R, G, and B are LED components which have red and a green and blue foreground color, respectively. Other notations and signs are the same as that of drawing 20 . The field enclosed with the rectangle of a broken line is the unit unit 1, and green is constituted by the LED component two pieces, red, and whose blue total [which are one piece each] four. Moreover, between unit units, the protection-from-light member 62 is arranged only perpendicularly. This protection-from-light member 62 is formed so that it may generally become longer in the normal 90 direction of a display than an LED component in order to avoid that outdoor daylight, such as the sun, illuminates an LED component.

[0011] According to the above arrangement, the "eclipse" phenomenon in which a part or all of light that turns on an observer is interrupted arises from the component arranged at the lower berth among the light emitting devices which constitute a unit unit with a protection-from-light means. If drawing 21 explains this, in looking up at a display at a bigger include angle than the include angle A which the boundary line of the visual field range of a vertical lower part and the normal 90 of a display unit which are shown with a broken line make, the above-mentioned "eclipse" phenomenon will start. The foreground color of the lower berth which constitutes a unit unit, i.e., the light of G and B, will be interrupted, so that the include angle becomes larger than an include angle A, and the foreground color whose rate of G and B decreased in the unit unit will be seen. if it puts in another way -- if -- R, G, and B -- even if all LED emits light and it is displaying the white image, the image which wore the yellow taste by this "eclipse" will be seen.

[0012] Furthermore, a this "eclipse" phenomenon causes un-arranging [of losing color balance in the vertical direction of a display unit], even when the observer is standing it still. That is, the amount by which light is interrupted becomes large and the unit unit above a screen will produce an irregular color in the upper and lower sides of a screen. For example, even if it increases the

number of the light emitting devices which constitute a unit unit, it enlarges the screen product equivalent to 1 pixel and it reduces the effect of an "eclipse" relatively, it is difficult to also enlarge a protection-from-light means inevitably in connection with this, and to acquire desired effectiveness. Such [after all] a phenomenon has a cause in the place where color mixture of each colored light is not fully carried out to an operation of a protection-from-light means in the screen of a unit unit regardless of the arrangement and quantity of each color LED in a unit unit. Therefore, if desired contrast was not made to be acquired even if strong outdoor daylight, such as the sun, gave priority to the installation conditions which do not advance directly and made the protection-from-light means small conventionally, it was difficult to control the effect of an "eclipse."

[0013] Moreover, drawing 22 is the sectional view having shown typically the synchrotron orbital radiation from LED of the conventional full color LED display indicated by JP,8-202292,A. drawing -- setting -- 2R -- red LED and 2G -- green LED and 2B -- for a resin lens and 40, a cylindrical concave lens and 70 are [blue LED, and 3R, 3G and 3B / an LED pellet, and 4R, 4G and 4B / an optical axis and P of a lenticular lens and k] 1 pixel. Next, actuation is explained. Red and the blue LED pellets 3R and 3B are formed in the outside of the optical axis of a resin lens among the red and green and blue LED which form 1 pixel, and the chief ray emitted from LED of each color is converged. Furthermore, the chief ray of each color is made refracted in the parallel light of a pitch narrower than the pitch of LED with a refraction means, and it is constituted so that you may make it horizontally spread with a diffusion means. Since according to such a configuration the chief ray emitted from LED of each color which forms 1 pixel carries out color mixture and can be seen in a short distance, degradation of the display quality resulting from the array structure of LED can be prevented.

[0014] By the way, in this conventional example, whenever [big diffusion angle] is not expectable in the direction which cannot expect the effectiveness by the configuration of both lenses, i.e., the direction where a lens configuration is repeated, and the direction which intersects perpendicularly because of the structure which controls the directivity of a display by lens operation of a cylindrical lens 40 and the lenticular lens 70. In order to fully acquire the effectiveness of the directional-characteristics control with a cylindrical lens 40 and the lenticular lens 70, each LED component needs to have strong directional characteristics, and, as for the direction which cannot expect the effectiveness of both lenses, an angle of visibility becomes small reflecting the directional characteristics of each LED component. Even if it can follow, for example, can extend a horizontal angle of visibility, compared with this, the luminous intensity distribution of the perpendicular direction will be carried out only to the very narrow visual field range. Since a means to equalize dispersion in the directional characteristics of each LED component furthermore does not exist, it is difficult to avoid generating of the above-mentioned patchy pattern which occurs when a display is observed from across.

[0015] Furthermore, the component for controlling positively the contrast reduction resulting from an outdoor daylight component advancing into the screen directly does not exist in this conventional example. Moreover, in order that beams of light other than the chief ray emitted from LED of each color may advance into the concave lens section corresponding to a contiguity pixel according to drawing 22 , such a beam of light produces un-arranging [of degrading display engine performance, such as resolution and contrast, as a result]. Since the LED chip itself is the light source with the volume of the finite which generates incoherent light, it is not avoided that the unnecessary light which cannot control a chip only in the lens operation of resin which carries out mold arises.

[0016] Moreover, drawing 23 is drawing showing roughly the conventional full color LED display configuration indicated by JP,8-202291,A, and it is drawing where, as for a sectional view and the left, the right looked at the display from the transverse plane. As for 4a, a plano-convex lens and 6a of a lens matrix and 4b are the light emitting diodes with which a protection-from-light means and 6b were equipped with opening, and D was equipped with the ****** lens. Moreover, it is the reflector on which P mounts an LED pellet and R mounts the LED pellet P. Plano-convex lens 4b by which the protection-from-light means was formed in the flat-surface section is arranged in the location corresponding to the lens section of light emitting diode D arranged in

the shape of a matrix so that the convex section may counter the above-mentioned lens section, opening 6b which penetrates the light condensed in the above-mentioned convex section at protection-from-light means 6a is formed in it, and an LED display equipment is constituted.

[0017] Since according to such a configuration it is condensed by refraction operation of plano-convex lens 4b by which the light emitted from the lens section of each LED component counters the lens section and this, and is arranged, and minute opening 6b is penetrated efficiently and outdoor daylight is interrupted by protection-from-light means 6a of a large area, coexistence of brightness and high contrast can be aimed at. However, also in this conventional example, like the before conventional example, it cannot prevent completely upwards the light emitted from a certain LED component advancing to plano-convex lens 4b corresponding to the LED component which adjoins this, and such an invalid light will repeat a multiple echo between the lens sections of plano-convex lens 4b countered and arranged and an LED component. In this way, the effective beam of light which passes minute opening 6b decreases, in order to obtain brightness, the path of opening 6b must be enlarged, and un-arranging [of reducing contrast as a result] arises. Moreover, although a refraction operation of plano-convex lens 4b determines the directivity of the light which passed opening 6b, in order to make the angle of visibility of a display large enough, it is necessary to give the big power which makes the beam of light from an LED component refracted to plano-convex lens 4b. For example, the complicated process of forming a complicated aspheric surface configuration in a small plano-convex lens is the need and **. Since a means to equalize directional-characteristics dispersion of each LED component does not exist still like said conventional example, when a display is observed from across, it cannot avoid that the patchy pattern resulting from the brightness unevenness of each LED component which constitutes a display appears.

[0018] The large screen display to which this invention comes to arrange not only the above LED display equipments but the light emitting device which emits the light of mutually different wavelength in the shape of a matrix, Indoor, the light source unit of the display of an outdoor mold which provide a lot of people with a big screen image especially at coincidence, And dispersion in the directional characteristics in which two or more light emitting devices have the 1st purpose about application equipments, such as a display using this or a lighting system, is equalized, and property dispersion between individuals is offering few light source units. Moreover, light is efficiently led to a desired visual field field, and it aims at realizing luminescence of sufficient brightness in a visual field field.

[0019] Moreover, the 2nd purpose is equalizing dispersion in the directional characteristics which a light emitting device's has, and offering the high display of display homogeneity in an observation field by this light source unit. It aims at controlling the contrast reduction produced because outdoor daylight, such as sunlight and indoor illumination light, furthermore carries out incidence to the luminescence side of this light source unit, or the screen of the display constituted by the light source unit. It aims at mitigating un-arranging [which are produced by arrangement of structures, such as a protection-from-light member, or a light source unit] depending on whenever [angle-of-visibility], such as brightness and unevenness of a color, further again.

[0020] Furthermore, the 3rd purpose is offering application equipments, such as a drop which deflects light in the predetermined direction and displays a good fixed pattern on the visual field range of desired by this light source unit, and a lighting system which illuminates a desired field efficiently.

[0021]

[Means for Solving the Problem] It consists of a substrate means, a light emitting diode component arranged at the position of this substrate means, and a holographic optical element arranged ahead of this light emitting diode component in the light source unit concerning this invention.

[0022] Moreover, in a light source unit, it is arranged near a substrate means, the light emitting diode component arranged at the position of this substrate means, the holographic optical element arranged ahead of a light emitting diode component, and the light emitting diode

component, and consists of a protection-from-light means to support a holographic optical element.
[0023] Moreover, in a light source unit, a prism means is formed in the plane of incidence of light, and a holographic optical element consists of a transparence substrate ingredient with which the hologram side has been arranged in another field.
[0024] Moreover, a transparence substrate ingredient consists of a light filter which penetrates the wavelength component of the specific range alternatively in a light source unit.
[0025] Moreover, it consists of a holographic optical element which consists of a transparence substrate ingredient which has a substrate means, two or more light emitting diode components arranged at the position of a substrate means, a prism means to come to arrange the unit structure of having a different prism configuration corresponding to two or more luminescence dominant wavelength of this light emitting diode component, and this prism means, in the plane of incidence of light, and has a hologram side in another field in a light source unit.
[0026] Moreover, it consists of a holographic optical element which forms a hologram side in the optical outgoing radiation side of a substrate means, the light emitting diode component arranged at the position of this substrate means, the lens means arranged ahead of a light emitting diode component, and this lens means in a light source unit.
[0027] Moreover, in a light source unit, it becomes a substrate means, two or more light emitting diode components arranged at the position of a substrate means, and the array-like lens plate arranged in the 1st predetermined side from the holographic optical element arranged in the 2nd predetermined side.
[0028] Moreover, in a light source unit, two or more light emitting diode components are arranged so that the outgoing beam from each light emitting diode component may be condensed on each lens element of an array-like lens plate.
[0029] Moreover, in a light source unit, it becomes a substrate means, the light emitting diode component arranged at the position of a substrate means, and the light pipe which leads the light from a light emitting diode component to a predetermined field from the holographic optical element by which plane of incidence is arranged in this predetermined side.
[0030] Moreover, in a light source unit, it becomes a substrate means, the light emitting diode component arranged at the position of a substrate means, and the optical integrator which leads the light from a light emitting diode component to a predetermined field from the holographic optical element by which plane of incidence is arranged in this predetermined side.
[0031] Moreover, in a light source unit, it is arranged in the location from which the pellet of a light emitting diode component separated from the optical axis of the resin lens of a light emitting diode component.
[0032] Moreover, it consists of two or more light emitting diode components which emit the light of mutually different wavelength in a light source unit.
[0033] Moreover, in a light source unit, a diffusion means is arranged at the inside near the outgoing radiation opening edge of a light pipe.
[0034] Moreover, in a light source unit, the outgoing radiation opening end face of an optical integrator inclines from a field perpendicular to the normal of a light source unit.
[0035] Moreover, in a light source unit, even if there are few plane of incidence of an optical integrator and outgoing radiation sides, either is an aspheric lens.
[0036] Moreover, in a light source unit, a holographic optical element sticks to the outgoing radiation side of an optical integrator, and is arranged.
[0037] Moreover, the holographic optical element is equipped with both the refraction operation which deflects incident light in the one predetermined direction, and the diffusion which the predetermined range is made to diffuse in the light source unit.
[0038] Moreover, in a light source unit, distribution of the light diffused by the diffusion of a holographic optical element has a horizontally large property narrow in the vertical direction.
[0039] Moreover, in a display, a light source unit is arranged in the shape of a XY matrix, and luminescence of each light source unit is controlled.
[0040] Moreover, in a drop, a light source unit is arranged and the luminescence is controlled.
[0041] Moreover, in a lighting system, it is constituted by the aggregate of a light source unit or

a light source unit, and the luminescence is controlled.
[0042]
[Embodiment of the Invention] In the light source unit which is the gestalt of operation of this invention, the light emitted from the light emitting diode component arranged at the position of a substrate means carries out incidence to the holographic optical element arranged ahead of a light emitting diode component, and it works so that this light may be diffused in the predetermined direction.
[0043] Moreover, a holographic optical element is supported by a part of protection-from-light means, and it works so that it may be arranged ahead of a light emitting diode component.
[0044] Moreover, the light which carried out incidence to the holographic optical element is refracted with a prism means, and it works so that it may be further deviated and spread in respect of a hologram.
[0045] Moreover, it works so that the wavelength component of the specific range may be alternatively penetrated among the light which carried out incidence to the transparence substrate ingredient.
[0046]

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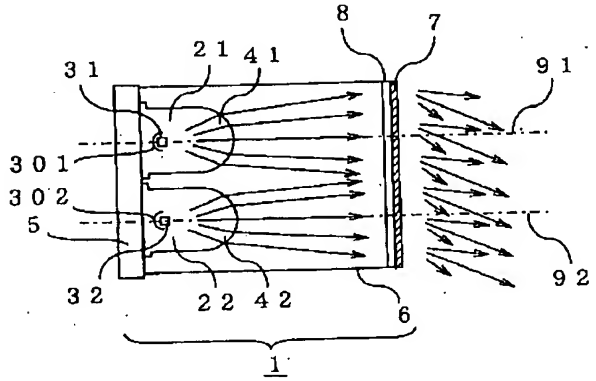
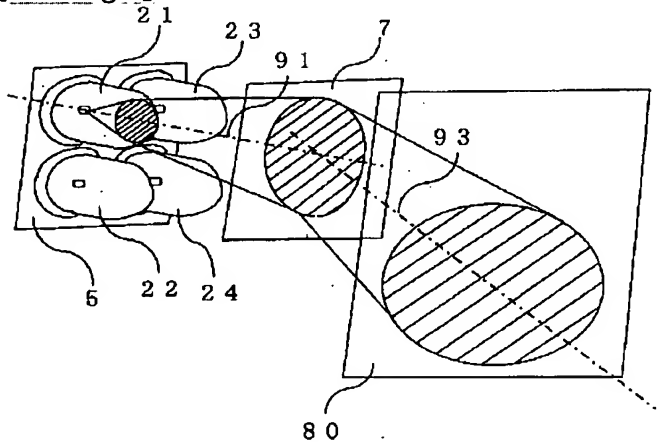
DRAWINGS

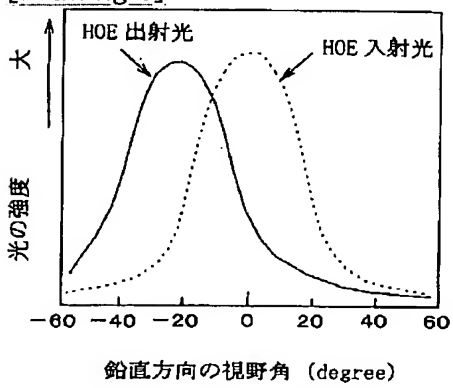
[Drawing 1]



[Drawing 2]



[Drawing 3]



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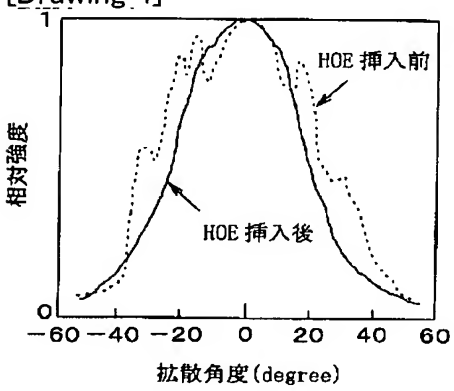

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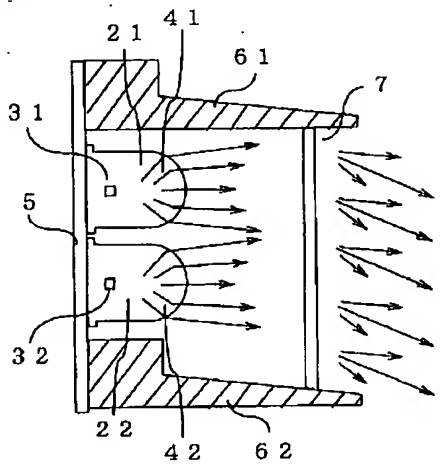
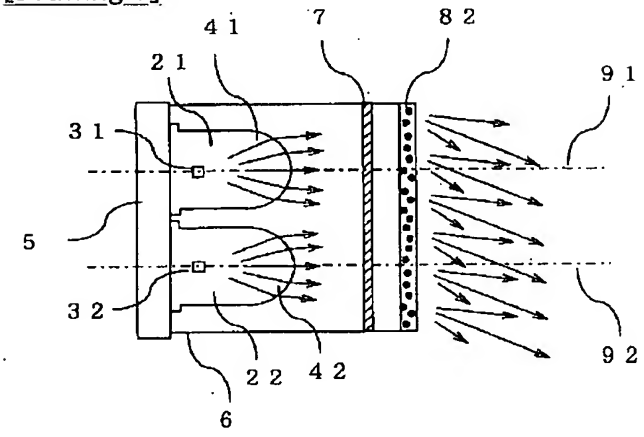


[Drawing 7]



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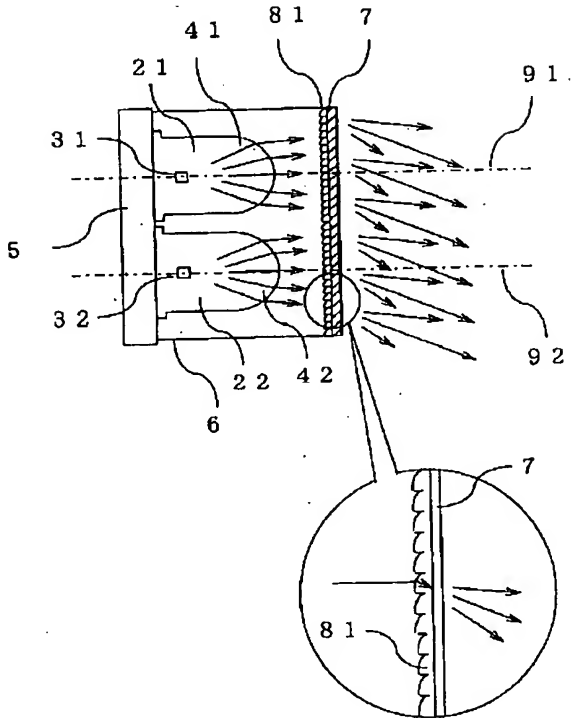

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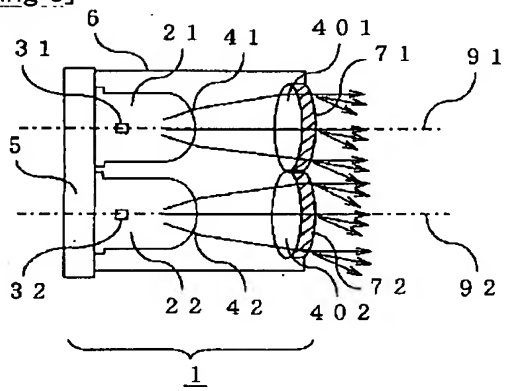

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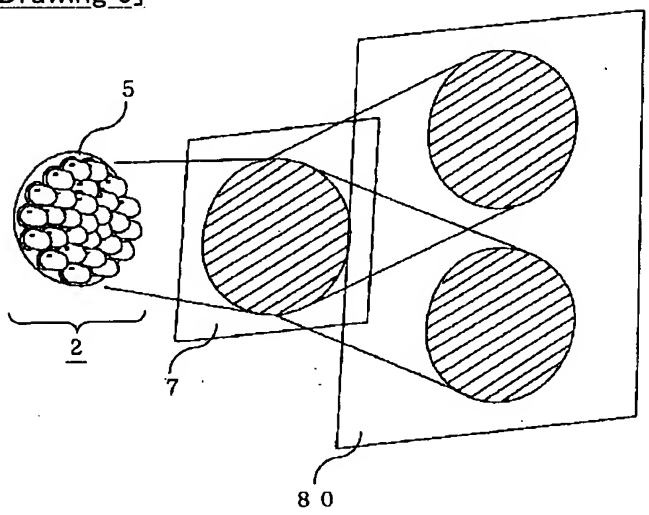

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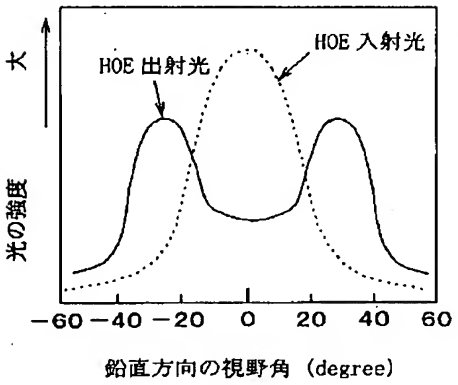

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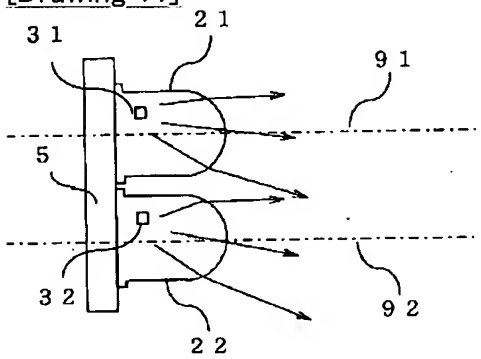

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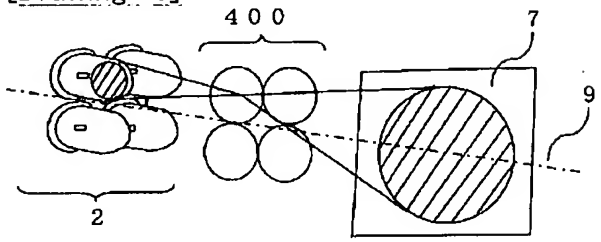

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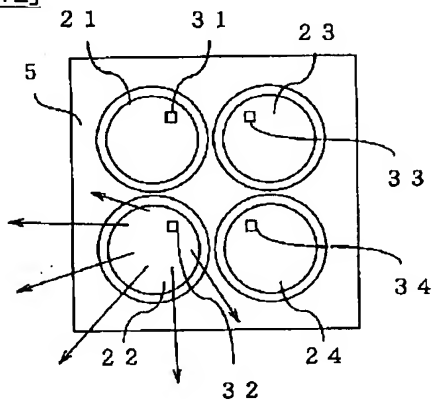
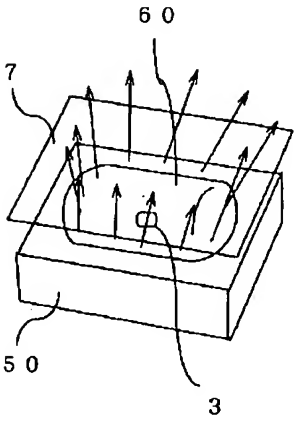
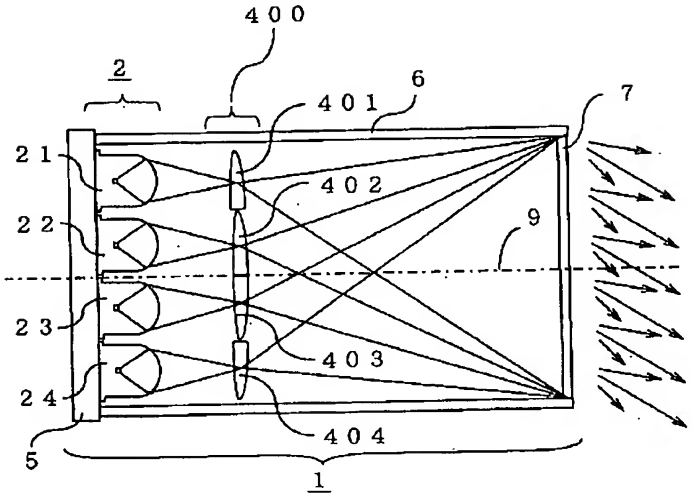


[Drawing 13]



[Drawing 14]



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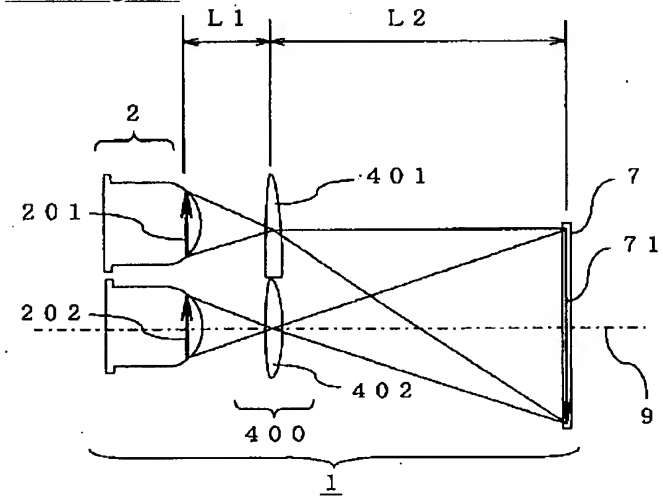

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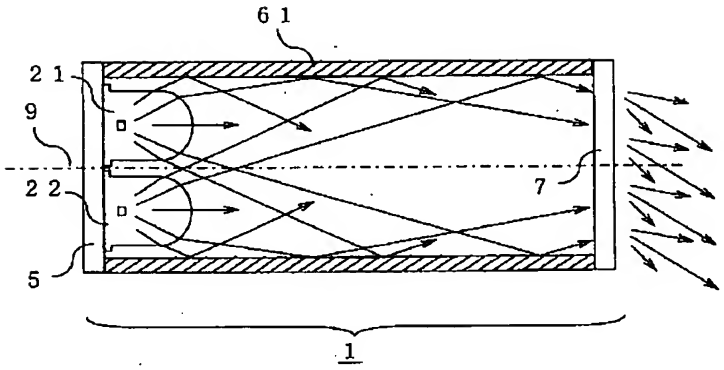
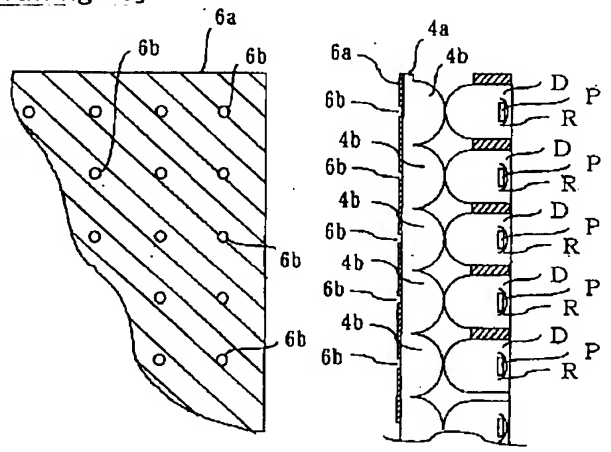
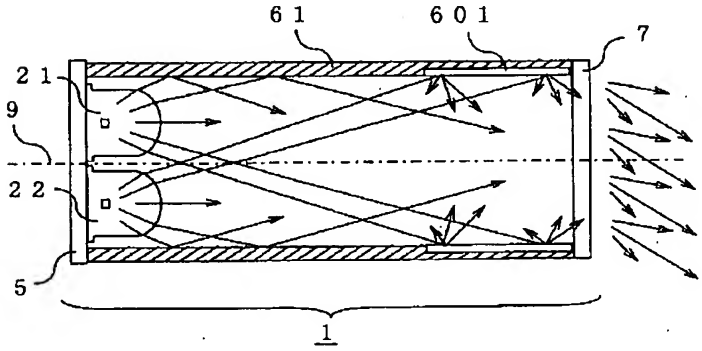


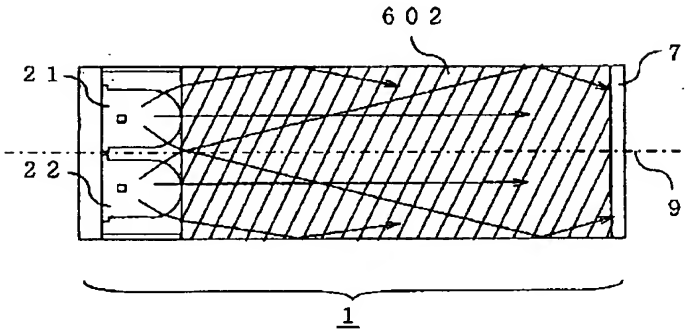
[Drawing 23]



[Drawing 18]



[Drawing 19]



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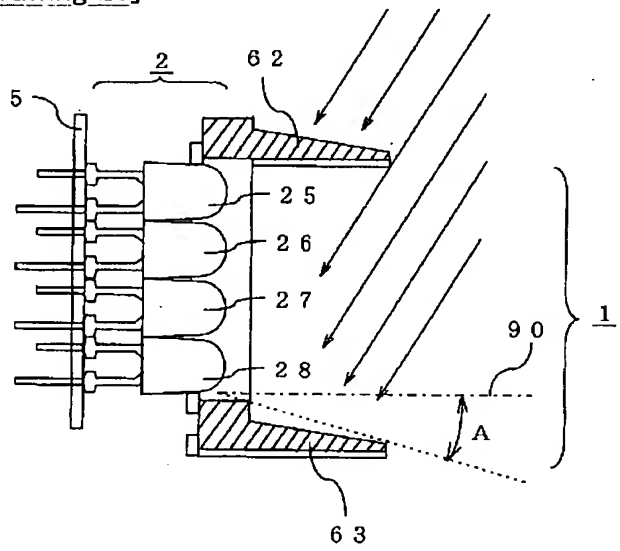
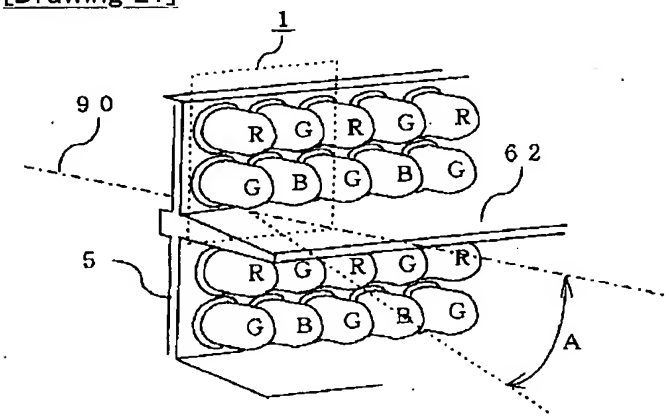
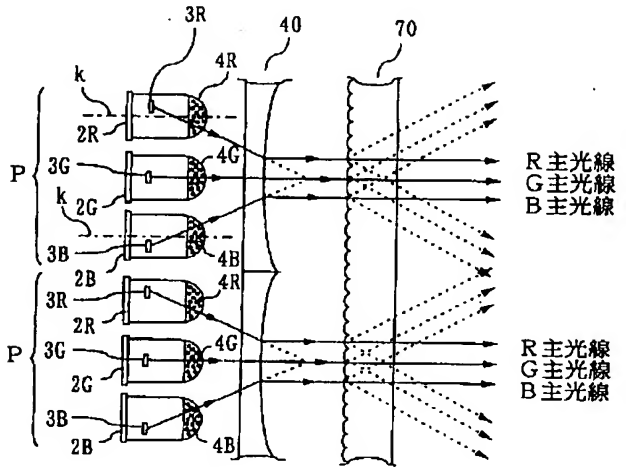


[Drawing 21]



[Drawing 22]



[Translation done.]